

1     What is claimed is:

2

1         1.     In a disk drive control system comprising a micro-controller, a micro-  
2     controller cache system having a cache memory and a cache-control subsystem, and a  
3     buffer manager communicating with the micro-controller cache system and a remote  
4     memory, a method for improving fetch operations between the micro-controller and the  
5     remote memory via the buffer manager, the method comprising:

6                 receiving a data-request from the micro-controller in the cache control  
7     subsystem wherein the data-request comprises a request for at least one of an  
8     instruction code and non-instruction data;

9                 providing the requested data to the micro-controller if the requested data  
10    reside in the cache memory;

11                 determining if the received data-request is for a non-instruction data if the  
12    requested data does not reside in the cache memory;

13                 fetching the non-instruction data from the remote memory by the micro-  
14    controller cache system via the buffer manager; and

15                 bypassing the cache memory to preserve the contents of the cache memory  
16    and provide the fetched non-instruction data to the micro-controller.

1         2.     The method of claim 1, wherein the determining is based on a signal  
2     received from the micro-controller.

1         3.     The method of claim 2, wherein the fetching further comprises:

2                 transmitting a cache control subsystem data-request from the cache control  
3     subsystem to the buffer manager;

4                 accessing the remote memory by the buffer manager; and

5                 retrieving the cache control subsystem requested data from the remote  
6     memory.

1         4.     The method of claim 1, wherein the buffer manager is in communication  
2     with a plurality of control system clients and provides client-requested data to the clients  
3     from the remote memory.

1       5.     The method of claim 4, wherein the plurality of control system clients  
2     comprises at least one of a disk subsystem, an error correction code subsystem, and a host  
3     interface subsystem.

1       6.     The method of claim 1, wherein the remote memory comprises a dynamic  
2     random access memory (DRAM).

1       7.     The method of claim 1, further comprising:  
2              determining if the received data-request is for an instruction code if the  
3              requested data does not reside in the cache memory; and  
4              filling the cache memory if the received data-request is for an  
5              instruction code.

1       8.     The method of claim 7, wherein the filling the cache memory comprises a  
2     burst fill of the cache memory.

- 1        9. A disk drive control system comprising:  
2              a micro-controller; and  
3              a micro-controller cache system in communication with the micro-  
4              controller and comprising a cache memory and a cache-control subsystem,  
5              wherein the micro-controller cache system is adapted to:
  - 6                  a) receive a data-request from the micro-controller in the cache  
7                      control subsystem wherein the data request comprises a request for  
8                      at least one of an instruction code and non-instruction data,
  - 9                  b) provide the requested data to the micro-controller if the requested  
10                 data reside in the cache memory,
  - 11                 c) determine if the received data-request is for a non-instruction data  
12                 if the requested data does not reside in the cache memory,
  - 13                 d) fetch the non-instruction data from the remote memory via a buffer  
14                 manager adapted to provide the micro-controller cache system with  
15                 micro-controller requested data stored in a remote memory, and
  - 16                 e) bypass the cache memory to preserve the contents of the cache memory  
17                 and to provide the fetched non-instruction data to the micro-controller.
- 1        10. The disk drive control system of claim 9, wherein the cache control  
2        subsystem it is further adapted to determine if the received data-request is for a non-  
3        instruction data based on a signal received from the micro-controller.
- 1        11. The disk drive control system of claim 10, wherein the micro-controller  
2        cache system is further adapted to:
  - 3              a) transmit a cache control subsystem data-request from the cache control  
4              subsystem to the buffer manager;
  - 5              b) access the remote memory via the buffer manager; and
  - 6              c) receive the cache control subsystem requested data from the remote  
7              memory.
- 1        12. The disk drive control system of claim 9, wherein the buffer manager is in  
2        communication with a plurality of control system clients and provides client-requested  
3        data to the clients from the remote memory.

1           13.     The disk drive control system of claim 12, wherein the plurality of control  
2     system clients comprises at least one of a disk subsystem, an error correction code  
3     subsystem, and a host interface subsystem.

1           14.     The disk drive control system of claim 9, wherein the remote memory  
2     comprises a dynamic random access memory (DRAM).

1           15.     The disk drive control system of claim 9, wherein the micro-controller  
2     cache system is further adapted to:

3                 determine if the received data-request is for an instruction code if the  
4     requested data does not reside in the cache memory; and

5                 fill the cache memory if the received data-request is for an instruction code.

1           16.     The disk drive control system of claim 15, wherein the cache memory is  
2     filled with a burst fill.